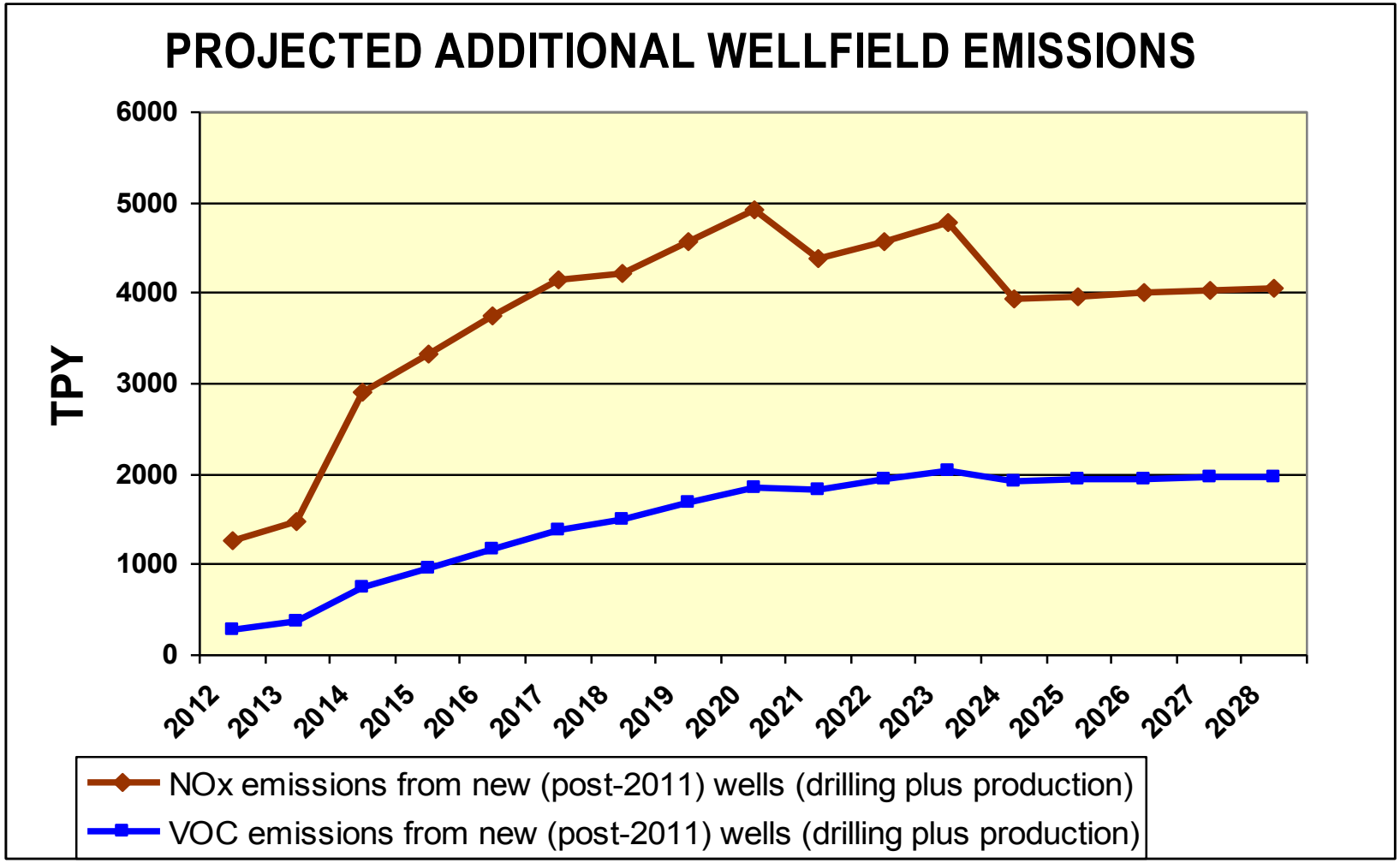
Personal presentation

Some things I learned.
Some taken-home points.

Future Plans –

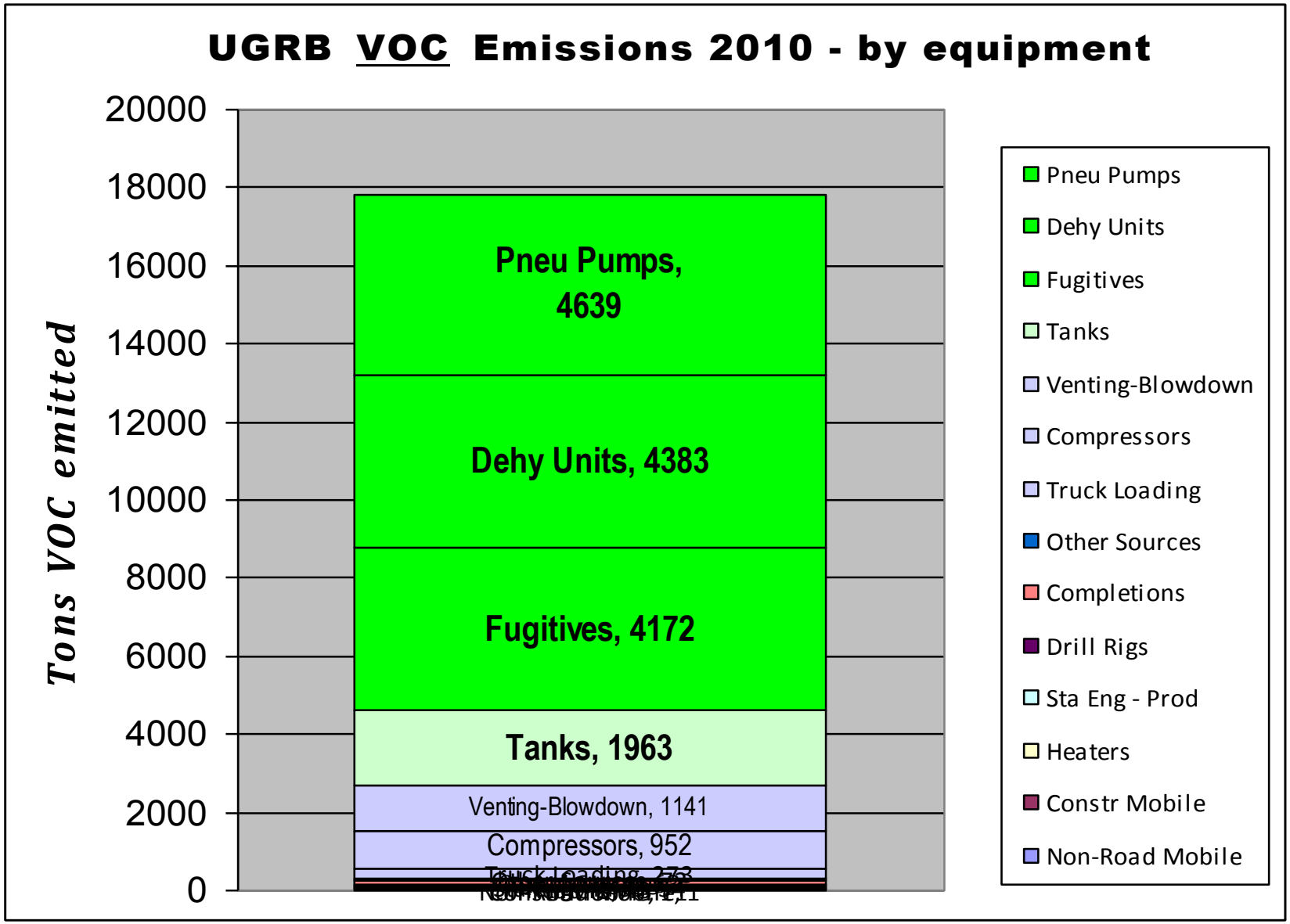
Accommodate New Sources and Meet Goals



Focus on the Largest Sources

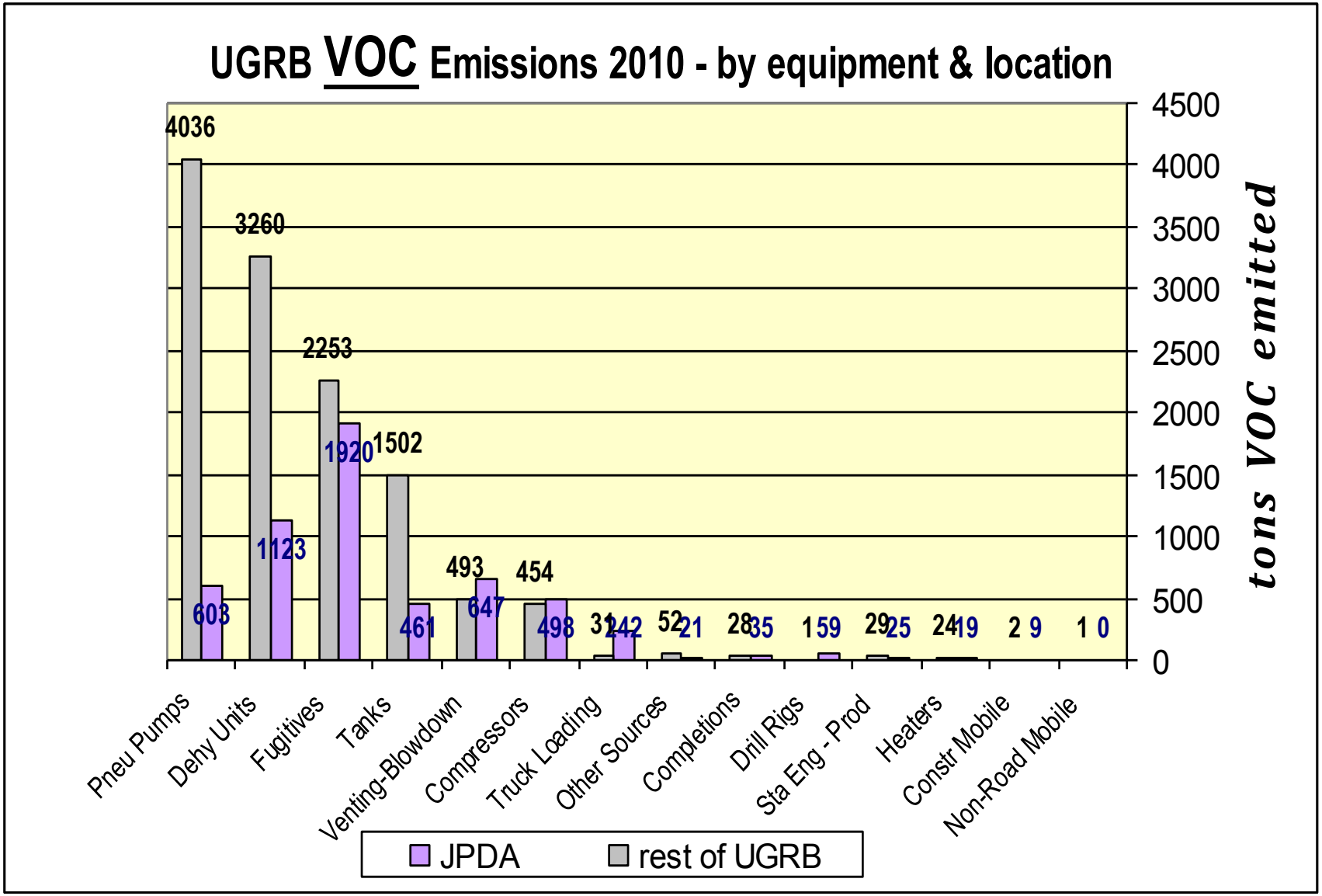
VOCs

VOC EMISSIONS : 4 SOURCES WORTH TALKING ABOUT



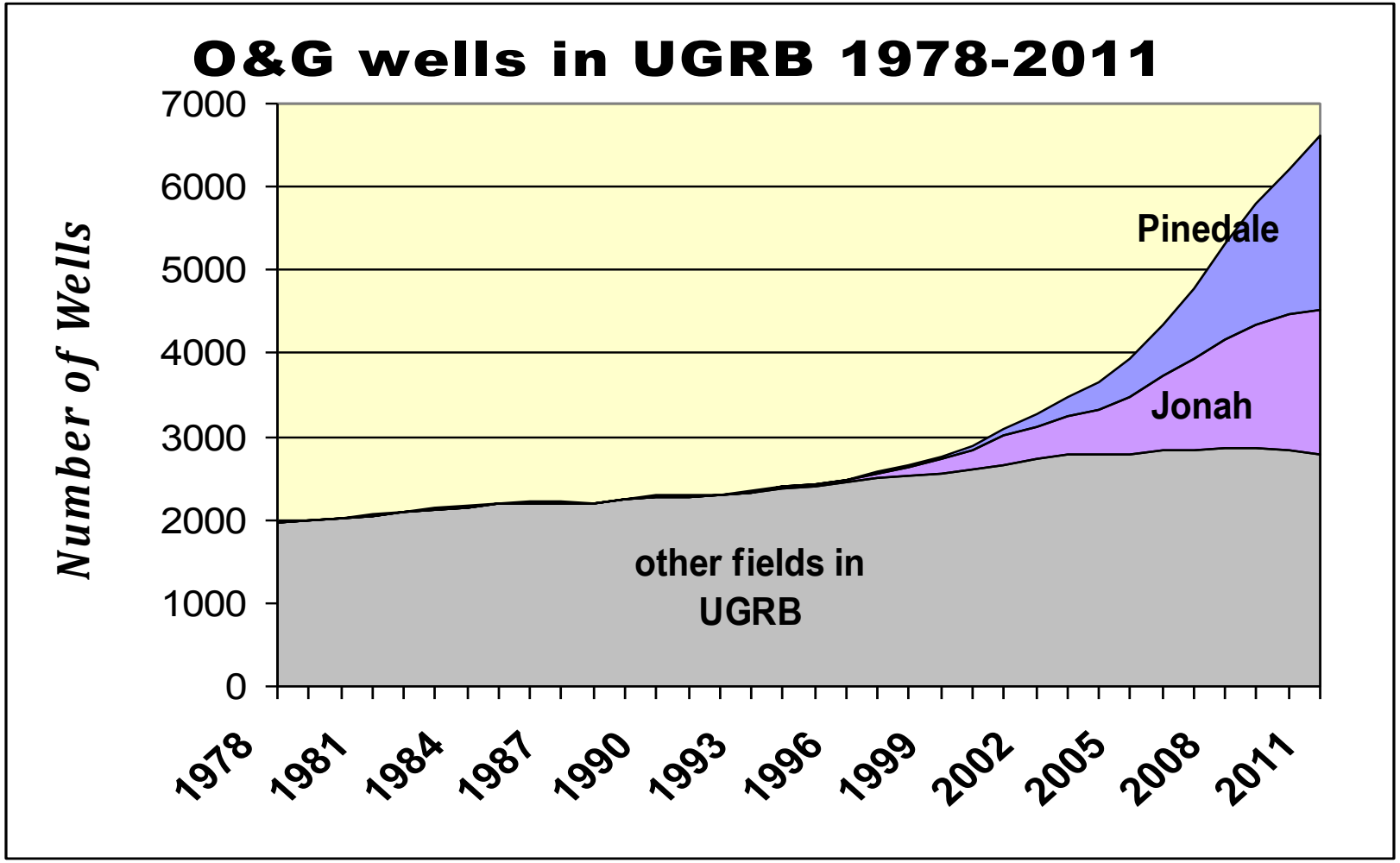
AN ODD FACT:

AMONG THE 4 MAIN VOC SOURCES IN OUR AIRSHED THE MAJORITY EMISSIONS ARE FROM REST OF UGRB



WHY / HOW THIS HAPPENED:

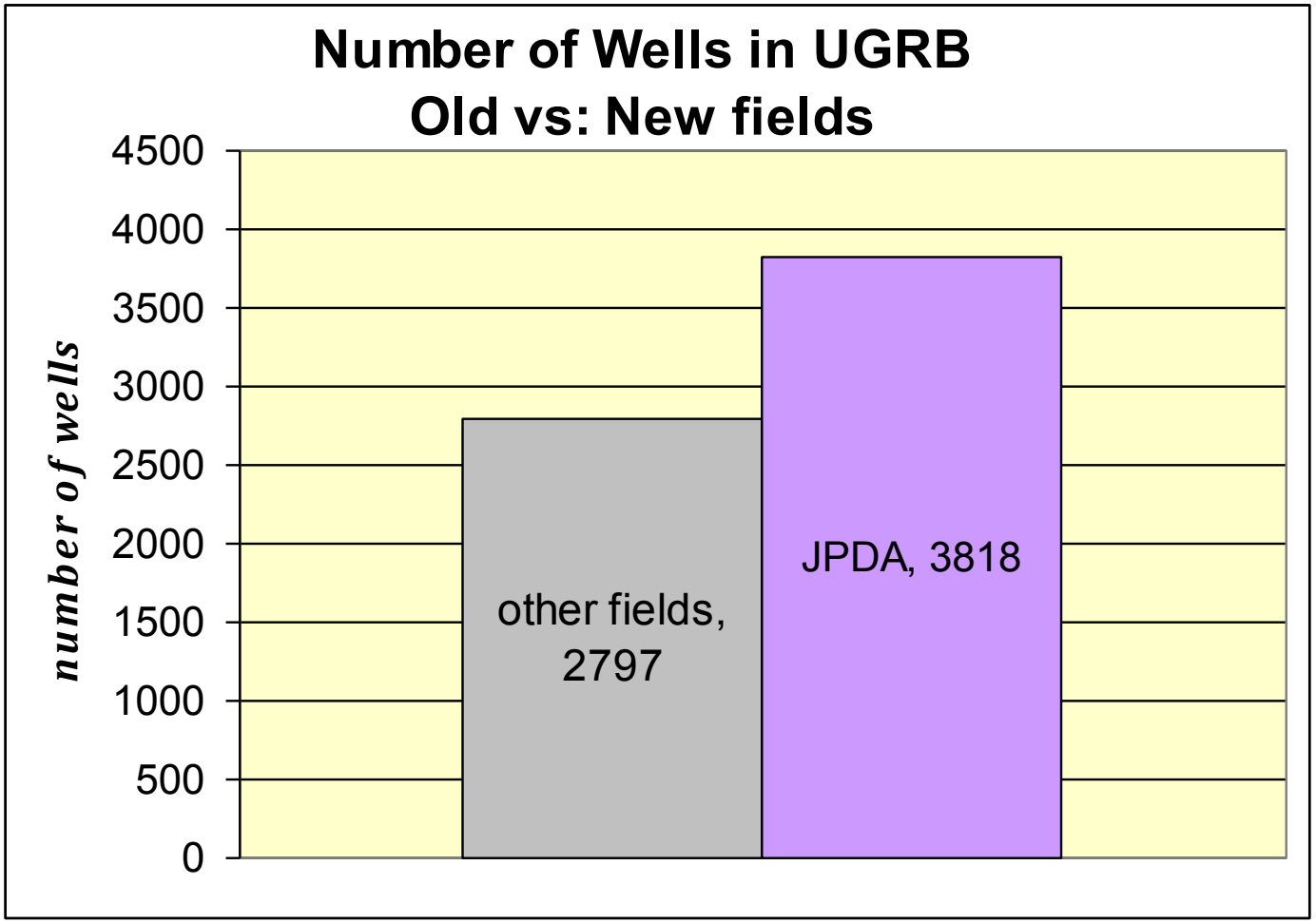
DEQ-AQ REGULATIONS CHANGED OVER TIME, ESPECIALLY IN 2002.
FACILITIES PERMITTED BEFORE 2002 EMIT MORE VOC
MOST JOHAH-PINEDALE WELLS WERE PERMITTED AFTER 2002



ABOUT 58% of UGRB WELLS are in JONAH-PINEDALE

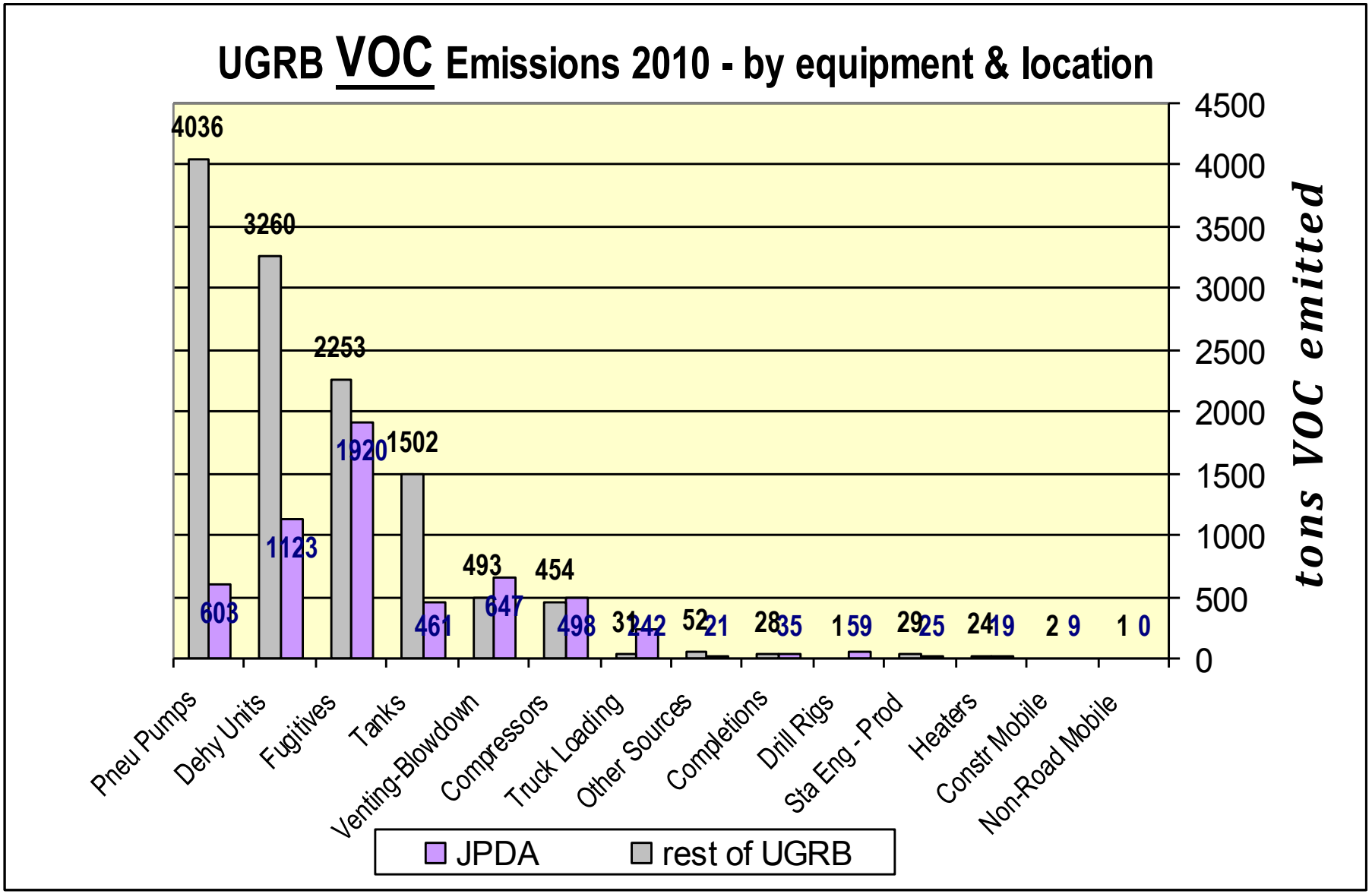
ABOUT 42% are in OLDER FIELDS

☻ NOTE HOW THE GRAY BAR IS SHORTER THAN THE PURPLE ☻



(THE SAME 'ODD FACT' GRAPH AGAIN)

NOW - IMAGINE IF THE GRAY BARS WERE SHORTER THAN THE PURPLE



WHAT DOES THIS MEAN ???

It means that if all wells in the UGRB were brought to DEQ 2010 standards,

local VOC emissions would drop by about 7000 tons (39%)

POSSIBLE IMPROVEMENTS TO 2010 STANDARD ? YES !

- **COMPLETELY ELIMINATE (NAT GAS-DRIVEN) PNEUMATIC PUMPS, CHANGE TO SOLAR-POWERED PUMPS (BP example)**
- **COMPLETELY ELIMINATE VENTING EMISSIONS (Ultra example)**
- **MORE IDEAS - ASK THE ENGINEERS !!**

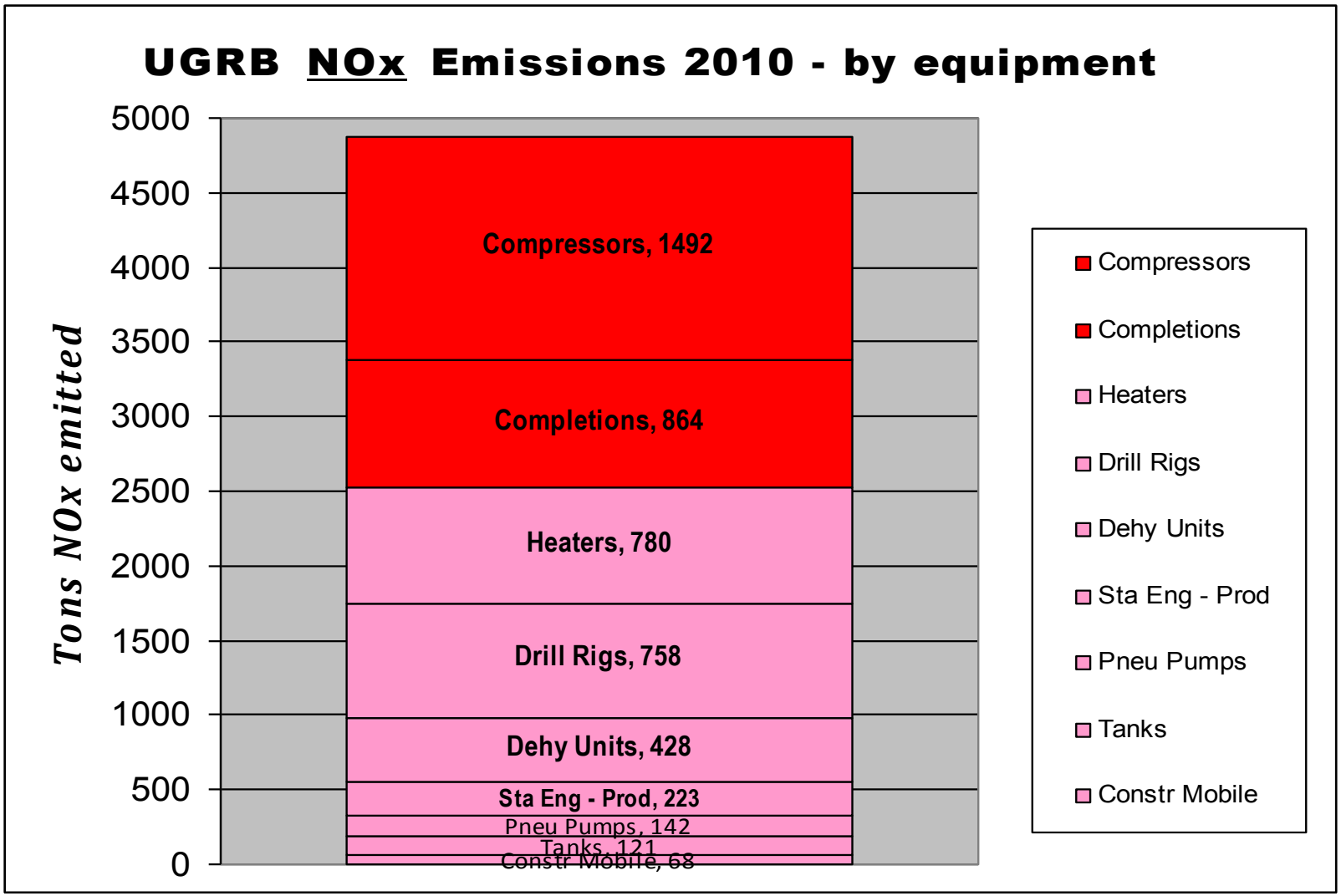
Focus on the Largest Sources

NOx

NOx EMISSIONS : LARGEST SOURCES

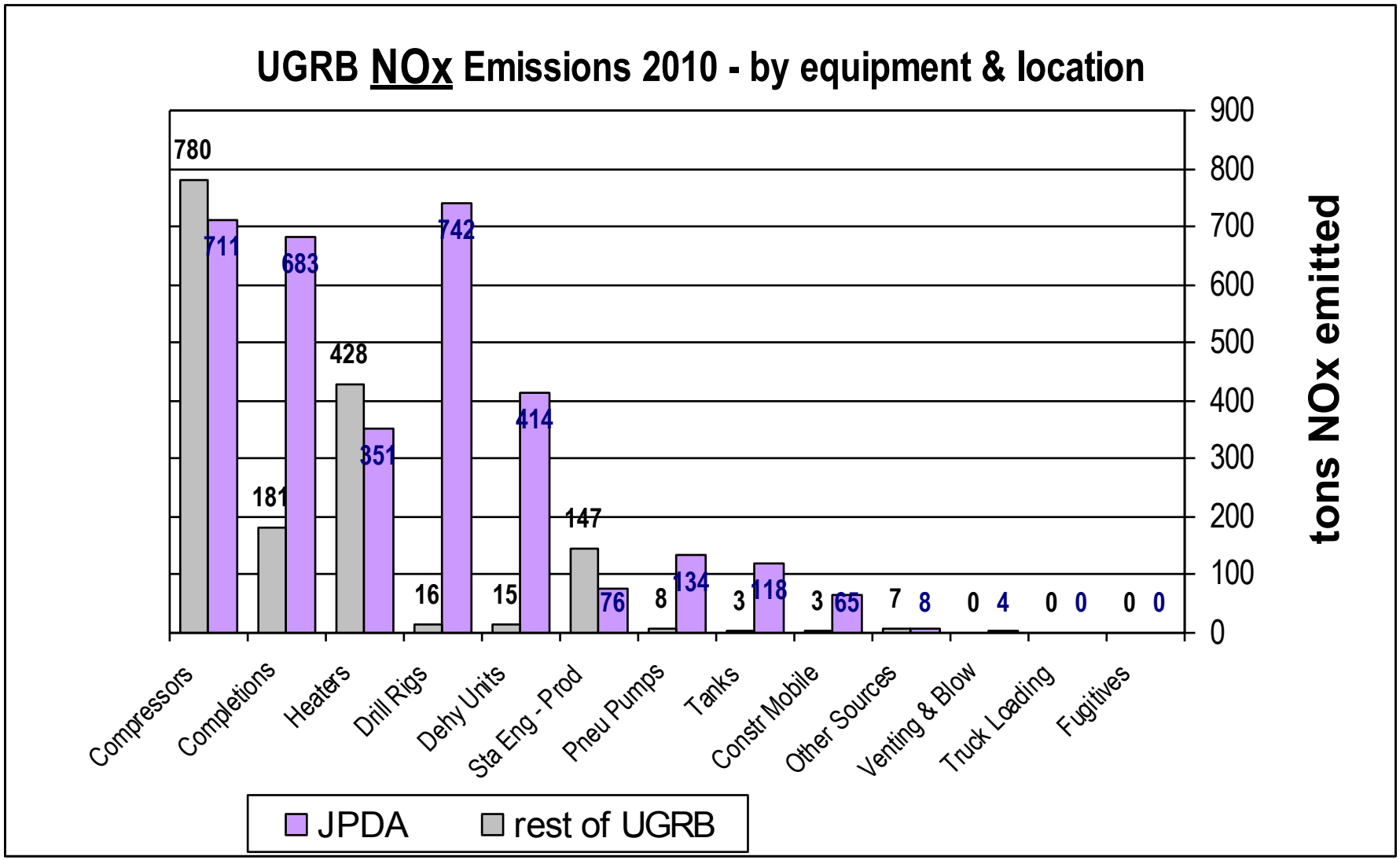
NOTE: In 2011, SCR was installed on drill rigs, reducing NOx by ca 500 tons.

(NOx from drill rigs now is much smaller than shown below.)



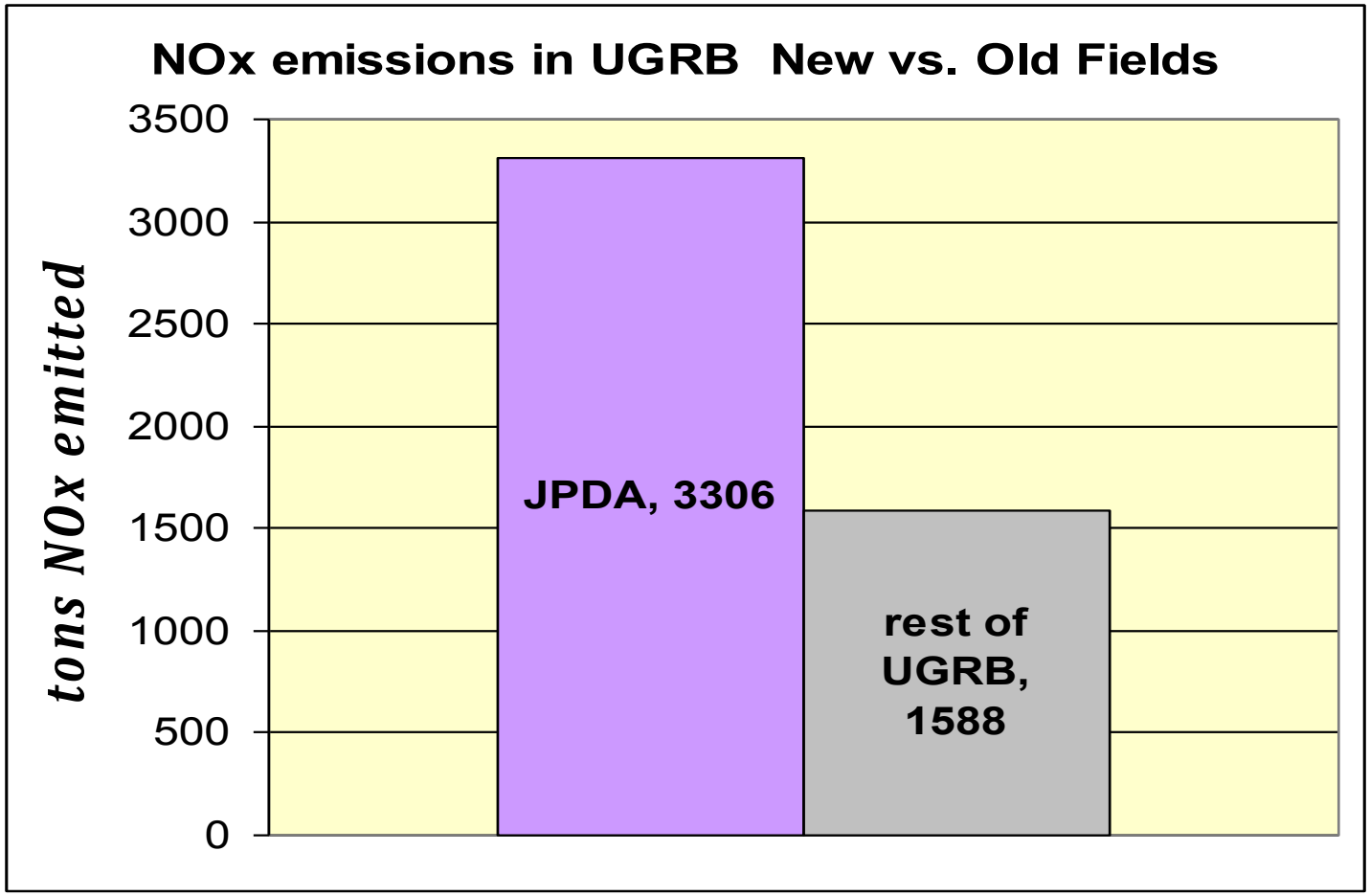
AN INTERESTING FACT:

NOx SOURCES ARE ASSOCIATED WITH EXPLORATION



ABOUT 67% of UGRB NOx emissions are from JONAH-PINEDALE
ABOUT 32% are from OLDER FIELDS

Historical note: "Rest-of-UGRB" emissions approximately reflect those of the UGRB in 2000.
(Permitted sources in the "rest-of-UGRB" have changed little since 2000. JPDA development began in earnest in 2000.)



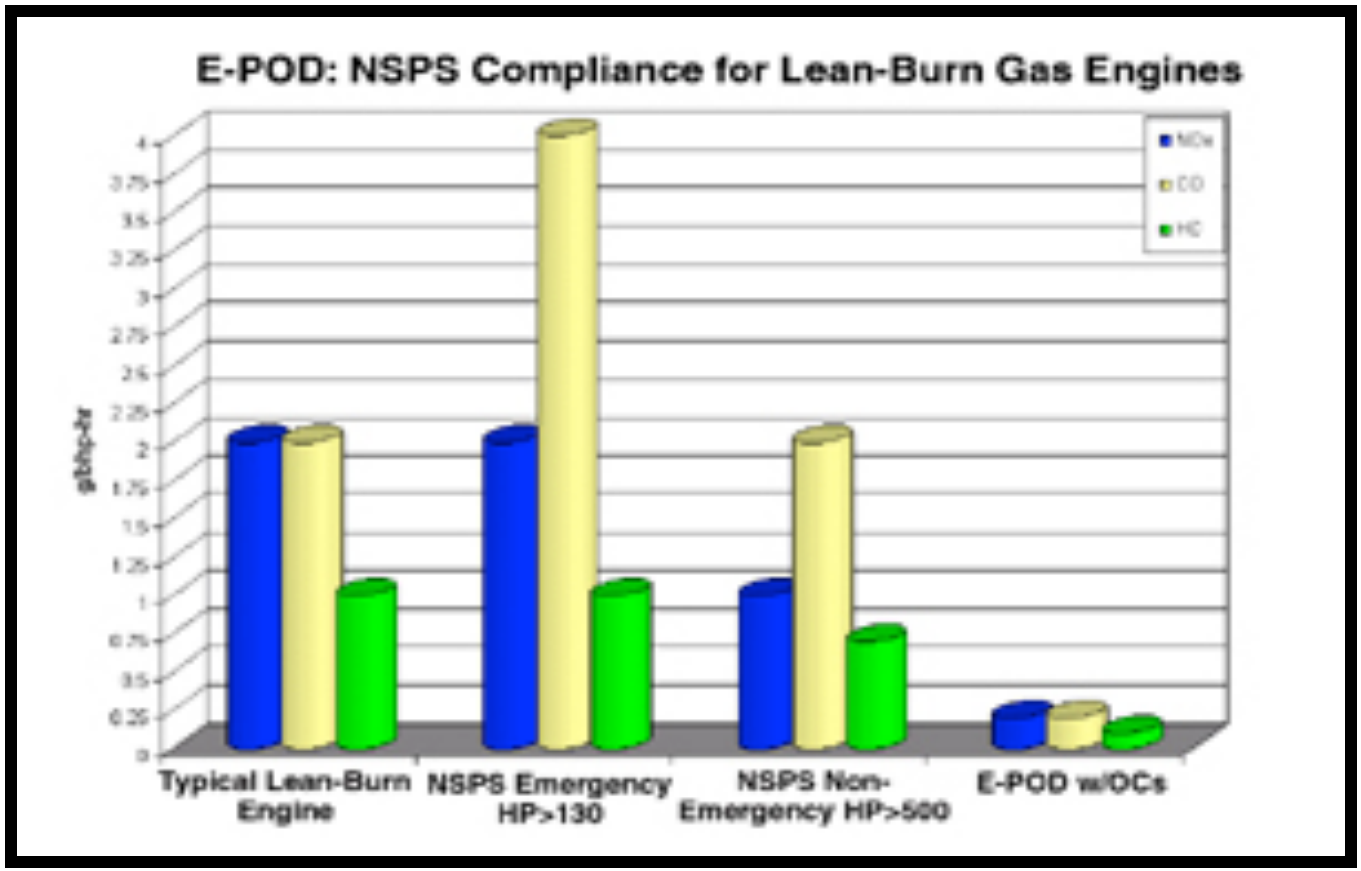
SCR technology - now on all drill rig engines in UGRB

SCR - for compressor engines ?

SCR - for Completion engines ?

Emissions Source	Control technology	Precursors controlled	Comments
Engines 4SRB (rich burn)	Non-selective catalytic reduction (NSCR)	NOx, VOC	Performance difficult to manage for low hp engines
Engines 4SLB (lean burn), diesel	Selective Catalytic Reduction (SCR)	NOx, VOC	Costly and bulky, new lean burns already are low NOx
	Oxidation Catalyst	VOC	Needs high exhaust temp to effectively reduce VOC
Heaters/boilers	Low NOx burner	NOx	Used for large heaters/boilers

One advertised product:



- Works with diesel or natural gas engines
- For stationary generators, pipeline compressors, and pumps
- Reduces NOx up to 95%

Future Plans –
Accommodate New Sources and Meet Goals